

PUBLIC HEALTH BULLETIN

VOLUME 16 NUMBER 6

OCTOBER 2004

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Whooping cough increasing in South Dakota

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South Dakota and neighboring states are observing an increase in pertussis this year. Physicians and other health care providers are asked to heighten clinical suspicion for pertussis and order appropriate laboratory tests when a case is suspected.

Pertussis is a serious disease that is preventable by immunization. Whooping cough, or pertussis, is a highly communicable disease caused by the Gram negative coccobacillus *Bordetella pertussis*. The bacteria attach to the respiratory cilia, produce toxins that paralyze cilia, destroy mucosa, cause respiratory tract inflammation, interfere with the clearing of pulmonary secretions, and potentially cause pneumonia.

Pertussis is transmitted directly by respiratory droplets. After an incubation period of 6 to 20 days the clinical illness evolves in 3 phases:

1. Catarrhal phase: runny nose, sneezing, low-grade fever, malaise, progressively worsening cough. Patients are most contagious during the early catarrhal stage.
2. Paroxysmal phase: within 1-2 weeks coughing becomes more severe. The namesake “whoops” are created by severe paroxysmal coughing fits followed by rapid inhalations of air. During coughing spells the patient may turn blue, followed by vomiting and exhaustion. Between attacks the patient may appear normal. Lymphocytosis is usually present. The paroxysmal phase may last 6 weeks or longer.
3. Convalescent phase: coughing becomes less paroxysmal and disappears over 2 to 3 weeks.



Photo courtesy of WHO

Infants are at highest risk of complications. The most common complications are secondary pneumonia and otitis media. Other complications include seizures and encephalopathy. Hospitalization is often necessary for infants under 6 months of age. The case-fatality rate for pertussis is less than one percent.

Adults and adolescents with waning immunity, or those never vaccinated, may become infected with *B. pertussis*. Although adults and adolescents usually have milder illness, they may be a source of infection for infants. There is no animal or environmental reservoir for pertussis.

South Dakota epidemiology. In the 1930's South Dakota averaged 480 reported pertussis cases per year. The pertussis vaccine was introduced in the 1940's, causing a dramatic decline in the disease. The lowest number of cases were reported in the 1970's, averaging 4 cases per year. In the 1990's there were an average of 9 reports per year. In 2004, year to date, 34 cases have been reported.

Pertussis is a notifiable disease and should be reported immediately upon strong suspicion of disease (call 1-800-592-1861). The Department of Health investigates the source of infection and seeks contacts to the case. The DOH recommends that close contacts under 7 years of age be immunized, and that they and other close contacts are offered prophylaxis.

Prevention. Pertussis is prevented by a series of 3 immunizations given at 2, 4 and 6 months of age with acellular pertussis vaccine (component of DTaP). A 4th dose is recommended at 15-18 months and a 5th booster dose should be given when the child is 4-6 years old, before entering kindergarten. No adult pertussis vaccination is available, but one might be licensed in 2005.

Diagnosis. Consider pertussis when evaluating any infant, child or adult with an acute cough illness characterized by prolonged cough or paroxysms, whoop, or post-tussive gagging, vomiting. Infants may present with apnea and/or cyanosis. Unvaccinated infants may have marked lymphocytosis.

The diagnostic gold standard for pertussis is a positive culture. The preferred specimen collection method is with a nasopharyngeal aspirate; however, a nasopharyngeal Dacron swab may also be used. *Bordetella pertussis* are nutritionally fastidious bacteria cultivated on rich blood supplemented media. Swabs or aspirate should be placed in Regan-Lowe transport media if direct inoculation of appropriate media (modified Bordet-Gengou or Regan-Lowe) is not possible. Regan-Lowe transport media is available from the SD Public Health Laboratory (SDPHL). Many facilities across the state are provided with fresh transport media monthly. Please check with your laboratory staff to see if your facility has transport media available. If your facility does not receive transport media, and would like to, please contact the SDPHL. PCR (polymerase chain reaction) testing of nasopharyngeal swabs is available at the SDPHL. The direct fluorescent antibody (DFA) stain is unreliable, so this test should not be used to confirm pertussis. Serum antibody tests are not useful in the public health evaluation of pertussis. Please call the SDPHL with questions 1-800-592-1861.

Nasopharyngeal Specimen Collection (CDC. Guidelines for the Control of Pertussis Outbreaks. P 2-7.)***Nasopharyngeal Aspirate***

1. Connect a DeeLee suction catheter of size 6 or 8 French with mucous trap to vacuum pump or syringe with tubing that includes an in-line filter.
2. Immobilize the patient's head.
3. Gently insert the end of the catheter along the floor of the nasopharynx to the posterior pharynx. Insertion may induce coughing and tearing.
4. Apply suction by vacuum pump or syringe when the posterior pharynx is reached and maintain as the catheter is slowly withdrawn to the middle of the nasal cavity.
5. Discontinue suction and remove the catheter.
6. Flush catheter by aspirating 0.5-1.0 mls of Stainer-Scholte broth or 0.1% casamino acids solution through the catheter into the trap.
7. Using a sterile nasopharyngeal swab or bacteriologic loop, apply some of the aspirated material to one quadrant of a primary culture plate. (OR swirl a swab in the aspirate and then place the swab into transport media. Please ALSO SEND THE ASPIRATE SAMPLE which can be used directly for the PCR testing. It is very important that a sample of the aspirate be placed into the transport media for culture.)
8. Seal the ends of the trap, label the specimen and primary plate with the accession number/patient identifier. Refrigerate if not transported to the laboratory immediately.
9. Place all waste materials in a disposable biohazard bag for discard at the laboratory.

Nasopharyngeal Swab

1. Immobilize the patient's head.
2. Gently insert nasopharyngeal swab into a nostril until the posterior nares is reached.
3. Leave the swab in place for up to 10 seconds. This procedure may induce coughing and tearing. If resistance is encountered during insertion of the swab, remove it and attempt insertion on the opposite nostril.
4. Remove the swab slowly.
5. Streak one quadrant of the primary culture plate, insert the swab into the transport medium, remove the portion of the handle extending above the tube and cap the tube. OR place in Regan-Lowe transport media for shipment to State Laboratory.
6. Label the transport tube and primary streak plates with the accession number/patient identifier and refrigerate if not transported to the laboratory immediately.
7. Place all waste materials in a disposable bag for discard at the laboratory.

Treatment and prophylaxis. Once pertussis has been diagnosed its spread can be controlled by treating the patient to prevent further transmission, and by giving antibiotic prophylaxis to close contacts of the patient. Treatment for pertussis, as well as prophylaxis for exposed persons, consists of 14 days of erythromycin. According to Red Book 2003, "The drug of choice is erythromycin (40-50 mg/kg per day, orally, in 4 divided doses; maximum 2 g/day). The recommended duration of therapy to prevent bacteriologic relapse is 14 days." If erythromycin is not tolerated, azithromycin or clarithromycin may be used according to accepted dosage regimes.

Exposed susceptible persons should receive prophylaxis. Exposure is defined as face-to-face contact, direct contact with respiratory, oral, or nasal secretions, or being in the same room with a coughing pertussis patient. Because the protective efficacy of pertussis immunization wanes after time, teenagers and adults are susceptible to pertussis, even if they were immunized as children. After exposure the incubation period for pertussis averages 9-10 days, but can range from 6-20 days.

Close contacts to observe for acute cough illness and to consider for chemoprophylaxis can include the following:

- Household contacts and family members;
- Infants, children, and other individuals at high risk for severe disease;
- Health care workers providing direct patient care;
- Child caregivers, staff, aides, babysitters and volunteers;
- Children attending a regular after-school care group or a play group;
- Core group of close friends, social contacts, boyfriends or girlfriends;
- Students who work closely together;
- Students sitting next to a case in school, or extracurricular activities, or sports teams;
- Bus seat-mates and carpool contacts;

- Contacts at regular social or church activities, or part-time jobs;

Isolation and exclusion. Hospitalized patients with known/suspected acute pertussis should be in respiratory isolation (droplet precautions) for at least the first 5 days of antimicrobial treatment. If isolation of outpatients is not feasible, patients must be encouraged to refrain from contact outside the household for the first 5 days of antimicrobial treatment.

Exposed health care workers should be queried daily for at least 21 days after exposure about possible pertussis symptoms -- acute cough, cough with paroxysms, whoop, or post-tussive gagging/vomiting. Persons with these symptoms should be given leave from work and allowed to return to work when they are well, another diagnosis is established, or they have been on appropriate antimicrobial treatment for 5 days.

Symptomatic persons should be excluded from child care, school, public activities or the workplace for the first 5 days of a full course of antibiotic treatment. Symptomatic persons who *do not* take antibiotic treatment should be excluded from child care, school, public activities or the workplace for 21 days from onset of cough.

Report known or suspected cases promptly to the Department of Health, 1-800-592-1861.

More information on pertussis treatment, diagnosis and control:

- CDC Pertussis website www.cdc.gov/health/pertussis.htm
- Red Book 2003, p 472-486, (American Academy of Pediatrics Report of the Committee on Infectious Diseases).
- Whooping cough fact sheet for general public: www.state.sd.us/doh/Pubs/pertuss.htm

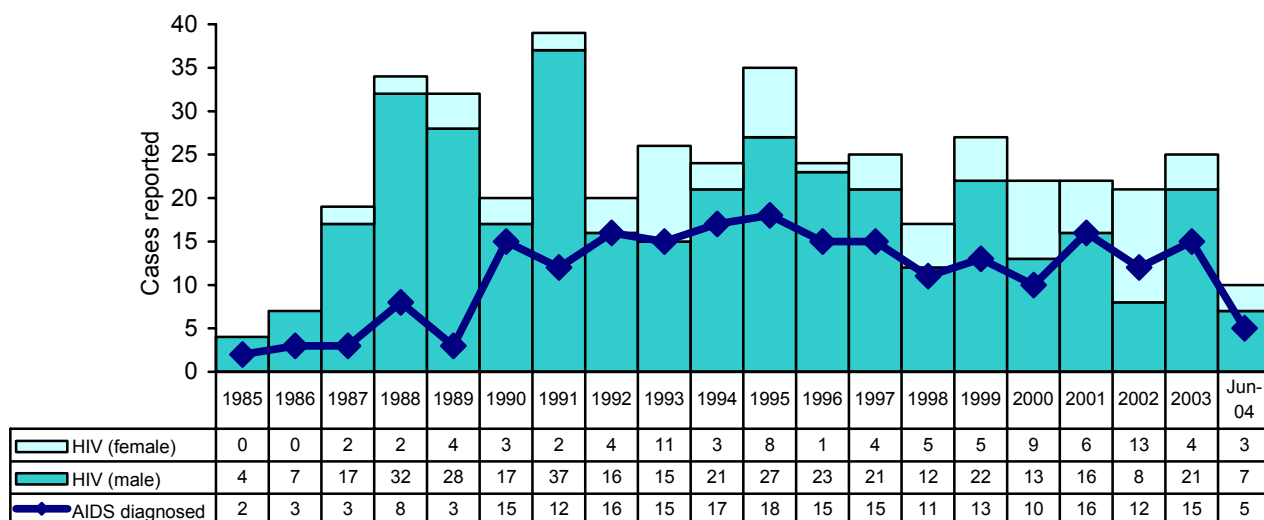
South Dakota HIV/AIDS Cumulative Statistics, 1985 – June 2004

Residents reported infected with HIV since 1985	453
Residents currently living with HIV/AIDS	310
Male residents currently living with HIV/AIDS	239
Female residents currently living with HIV/AIDS	71
Residents reported who have been diagnosed with AIDS	224
Residents infected with HIV who have died (of all causes)	135
Residents who have been diagnosed with AIDS and have died	108
South Dakota AIDS Fatality Rate	48%
Out-of-state AIDS cases who have died in South Dakota	55

United States Cumulative AIDS Statistics through December 2002

AIDS Cases Reported in the United States	886,575
AIDS Deaths Reported in the United States	501,669
AIDS Fatality Rate in the United States	57%

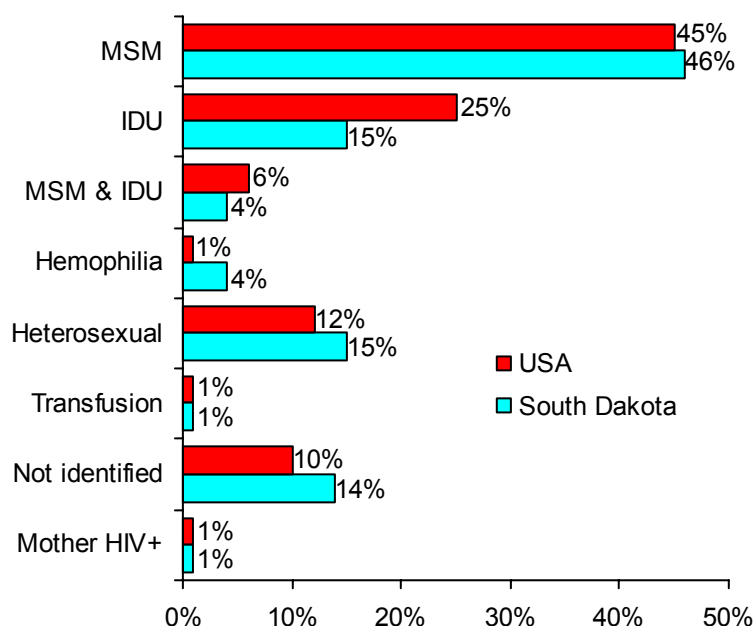
South Dakota Residents by Gender Infected with HIV, 1985- June 2004



At the end of June 2004, 453 SD residents had been reported as infected with HIV (364 male, 89 female) and 224 of those had also been diagnosed with AIDS. Some cases may have been reported as an HIV case in a different year than they were diagnosed with AIDS.

HIV/AIDS cases reported by race/ethnicity, sex, and age, SD, 1985- June 2004

Age at diagnosis	White		Native American		Black		Hispanic & other		All groups		Total
	Male	Female	Male	Female	Male	Female	Male	Female	M	F	
Under 5 yrs	2	1	1	2	0	0	1	0	4	3	7
5-12 yrs	3	0	1	0	0	0	0	0	4	0	4
13-19 yrs	10	2	0	2	2	0	1	1	13	5	18
20-29 yrs	77	20	14	7	10	5	6	1	107	33	140
30-39 yrs	117	14	19	9	15	6	2	0	153	29	182
40-49 yrs	44	8	7	2	3	1	1	0	55	11	66
50-59 yrs	13	4	4	0	1	2	1	2	19	8	27
≥60 yrs	8	0	1	0	0	0	0	0	9	0	9
Sub- Total	274	49	47	22	31	14	12	4	364	89	453
Total	323		69		45		16		453		

HIV AIDS Cases by Exposure Category*, SD & USA*****

*MSM (men who have sex with men)

*IDU (injection drug user)

**South Dakota HIV/AIDS cases 1985-June 2004

***US AIDS cases through 2002

Sometimes 2 or more exposures are reported for one case.
This table is consistent with the CDC hierarchy of exposures.

Since the beginning of the epidemic, males have accounted for the majority of the reported HIV/AIDS cases each year, except in 2002.

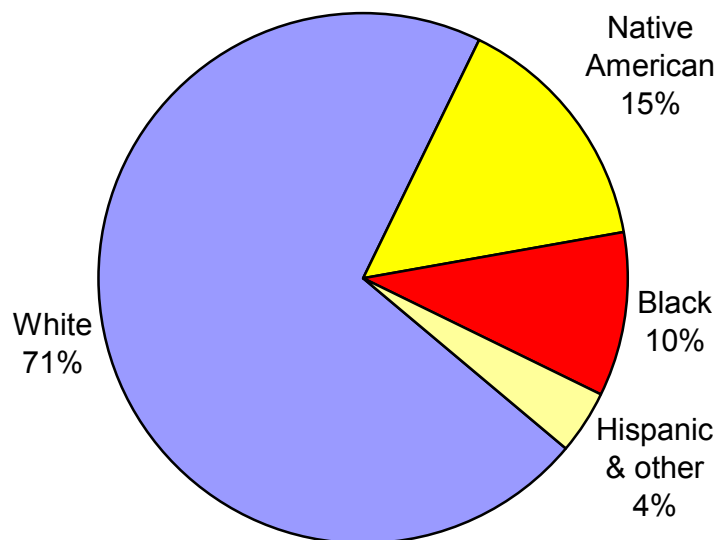
South Dakotans living with HIV/AIDS (n=310)

GENDER	Cases	Percent
Male	239	77%
Female	71	23%
Total	310	100%

RACE	Cases	Percent
White	211	68%
Native American	43	14%
Black	42	14%
Hispanic & Other	14	4%
Total	310	100%

AGE	Cases	Percent
0-12 years	3	1%
13-19 years	3	1%
20-29 years	30	10%
30-39 years	91	29%
40-49 years	126	41%
50+ years	57	18%
Total	310	100%

RISK	Cases	Percent
MSM	130	42%
Injection drug use	54	17%
MSM and IDU	10	3%
Heterosexual	54	17%
Transfusion	2	1%
Hemophilia	10	3%
Mother HIV+	4	1%
No risk identified	46	16%
Total	310	100%

SD HIV/AIDS Cases by Race/Ethnicity, 1985- June 2004, (n = 453)

South Dakota Residents Reported with Associated Diseases, 1994- June 2004												
Diseases	Year	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
HIV/AIDS		24	35	24	25	17	27	22	22	21	25	10
Chlamydia trachomatis infections		1432	1317	1538	1439	1573	1554	1835	1821	2214	2606	1202
Gonorrhea		245	244	176	172	221	192	277	289	263	226	129
Herpes, genital and neonatal		110	102	102	94	142	275	339	345	310	299	174
Syphilis, Primary and Secondary		2	0	0	1	1	0	0	1	0	2	0
Chancroid		0	0	0	0	0	0	0	0	0	0	0
Hepatitis B		4	2	5	1	4	1	2	0	3	3	0

Department of Health Confidential HIV Testing Centers

For testing and counseling for HIV/AIDS and other sexually transmitted diseases, contact one of the following sites or call **1-800-592-1861**.

Aberdeen

402 S. Main St.
Aberdeen, SD 57401-4127
605-626-2373
1-866-805-1007 toll-free

Rapid City

909 E. St. Patrick, Suite 7
Rapid City, SD 57701
605-394-2289
1-866-474-8221 toll free

Watertown

913 5th St. SE
Watertown, SD 57201-5134
605-882-5096
1-866-817-4090 toll free

Sioux Falls

1200 N. West Ave.
Sioux Falls, SD 57104
605-367-5365
1-866-315-9214 toll free

Pierre

302 E Dakota
Pierre, SD 57501-3133
605-773-5348
1-866-229-4927 toll free

Dupree

Ziebach County Court House
Dupree, SD 57623-0068
605-365-5164

**National AIDS Hotline
1-800-342-2437**

Sexually transmitted diseases (STDs) and blood borne diseases are a reliable indicator of high-risk behavior (i.e., unprotected sexual intercourse) within populations and may increase the infectiousness of HIV.

AIDS has been a reportable disease in the U.S. and South Dakota since 1985. HIV infection without an AIDS diagnosis has been reportable in South Dakota since 1988. The tables and graphs provide information concerning South Dakota residents reported with HIV infection (non-AIDS) and AIDS.

The SD HIV/AIDS Surveillance Report is published semi-annually. Data contained in this report are provisional. Percentages may not equal 100% due to rounding.

Questions regarding the surveillance report may be directed to the HIV/AIDS Surveillance Coordinator (1-800-592-1861 or 605-773-3737). This report is available on the SD Department of Health website at www.state.sd.us/doh/disease/stats.htm or write to HIV Surveillance, 615 East 4th Street, Pierre, SD 57501. For HIV/AIDS information 24 hours a day call 1-800-342-2437 or see www.cdc.gov/nchstp/hiv_aids/dhap.htm.

South Dakota Department of Health HIV/AIDS website:
www.state.sd.us/doh/Pubs/HIVhow.htm

Centers for Disease Control and Prevention HIV/AIDS website:
www.cdc.gov/hiv/dhap.htm

South Dakota's Newborn Metabolic Screening Program

*by Lucy Fossen, RN, Newborn Metabolic Screening Coordinator,
Department of Health*

Newborn metabolic screening is an essential public health surveillance program for the early identification of serious health disorders. South Dakota's newborn metabolic screening program was instituted in 1973 and currently mandates screening of all newborns for phenylketonuria (PKU), congenital hypothyroidism, and galactosemia. Screening for additional disorders is also available through the program.

In addition to the mandated testing, South Dakota's Newborn Metabolic Screening Program offers supplemental newborn screening, which has the potential of detecting 30 additional metabolic disorders, including MCAD (medium chain acyl-CoA dehydrogenase deficiency). The supplemental testing has been available in South Dakota through the program since January 1999.

Currently, 92% of infants born in South Dakota receive this supplemental screening in addition to the mandated testing.

Since 1997, optional testing for hemoglobinopathy testing, or sickle cell disease (SCD) has also been available. Sickle cell disease refers to a group of complex genetic disorders variably characterized by anemia, severe pain, potentially life-threatening complications such as bacterial septicemia, splenic sequestration, acute chest syndrome, stroke, and chronic organ damage. A common misconception is that SCD affects only people of African ancestry; however, SCD can affect persons of any race or ethnicity. It occurs in approximately 1 in 400 African-American births in the U.S. and 1 in 2,700 Native American births. The prevalence in whites is 1 in 58,000 births, similar to that for galactosemia which is 1 in 60,000-80,000 births. The South Dakota Department of Health recommends universal screening for hemoglobinopathies. Approximately 7% of South Dakota newborns currently receive the hemoglobinopathy testing.

Both the supplemental and the hemoglobinopathy screening can be performed on the blood spot specimens collected at the same time as the mandated newborn screening specimen. In order for these tests to be performed, health care providers must select them on the newborn screening requisition form.

Testing results for South Dakota

Approximately 10,500 babies are born in South Dakota each year. The state's metabolic screening program identifies approximately 1 case of PKU per year, 5-7 cases of congenital hypothyroidism, and 1 case of classic galactosemia every 3-5 years. Since supplemental testing began, there have been 9 infants identified with MCAD deficiencies (positivity rate ~1 in 4,700). Four other life-threatening disorders were identified on infants tested.

**South Dakota Newborn Metabolic Screening Program
Not-Normal Test Results for Mandated Screens, 1997-2003**

	Total Births	# not-normal test results			# newborns confirmed with metabolic disease			# newborns with variant form
		PKU	CH	Gal	PKU	CH	Gal	
1997	10,159	93	137	4	0	1	0	Gal -1
1998	10,204	45	91	9	1	3	0	Gal - 3
1999	10,673	41	87	4	1	6	0	Gal – 1
2000	10,589	74	75	9	0	5	1	PKU – 1 Gal - 6
2001	10,784	42	108	14	2	6	0	Gal - 5
2002	11,015	5	137	13	1	3	0	Gal -7
2003*	11,503	4	116	13	0	3	0	Gal - 5 PKU - 1
PKU = phenylketonuria CH = congenital hypothyroidism Gal = galactosemia *2003 data are provisional								

Contract laboratory

South Dakota's Newborn Metabolic Screening Program utilizes a centralized laboratory, Sioux Valley Clinical Laboratories, for all initial, repeat and confirmatory newborn screening. The centralized laboratory process in newborn screening increases the reliability, uniformity and testing efficiency, as well as reducing costs for families. A centralized laboratory enhances the ability to provide early detection and treatment of newborn metabolic disorders.

More information about South Dakota's Newborn Metabolic Screening program can be found on the web at <http://www.state.sd.us/doh/Famhlth/newborn.htm> or call Lucy Fossen at 605-773-2944.

South Dakota Newborn Metabolic Screening Program
Additional Metabolic Disorders Tested for through Supplemental Screening

1. Argininemia
2. Argininosuccinate Lyase Deficiency (ASA)
3. Carnitine Palmitoyltransferase II Deficiency (CPT II)
4. Carnitine/Acylcarnitine Translocase Deficiency (TRANSLOCASE)
5. Citrullinemia
6. Glutaric Aciduria Type I (GA I)
7. Homocystinuria: Cystathionine Synthase Deficiency
8. 3-Hydroxy-3-Methylglutaryl-CoA Lyase Deficiency (HMG)
9. Hyperammonemia, Hyperornithinemia, Homocitrullinuria Syndrome (HHH)
10. Hypermethioninemia
11. Isobutyryl-CoA Dehydrogenase Deficiency
12. Isovaleric Acidemia (IVA)
13. Long-Chain Hydroxyacyl -CoA Dehydrogenase Deficiency (LCHAD)
14. Malonic Aciduria
15. Maple Syrup Urine Disease (MSUD)
16. Medium Chain Acyl-CoA Dehydrogenase Deficiency (MCAD)
17. 2-Methylbutyryl-CoA Dehydrogenase Deficiency
18. 3-Methylcrotonyl -CoA Carboxylase Deficiency
19. Methylmalonic Acidemia (MMA)
20. Mitochondrial Acetoacetyl -CoA Thiolase Deficiency (THIOLASE)
21. Multiple Acyl-CoA Dehydrogenase Deficiency MADD, GA II
22. Nonketotic Hyperglycinemia (NKH)
23. 5-Oxoprolinuria
24. Phenylketonuria (PKU)
25. Propionic Acidemia (PPA)
26. Short-Chain Acyl-CoA Dehydrogenase Deficiency (SCAD)
27. Trifunctional Protein Deficiency
28. Tyrosinemia Type I (TYR I)
29. Tyrosinemia Type II (TYR II)
30. Very Long-Chain Acyl -CoA Dehydrogenase Deficiency (VLCAD)

Although certain metabolic diseases are identified as detectable through the screening processes being performed, under no circumstances can it be guaranteed that the screening process will for each patient tested detect the existence or non-existence of each of the potentially detectable diseases. Like many screening processes, the screening conducted is not a diagnostic test. Rather, it is a tool to be utilized by health care providers to assist in detecting the existence of certain diseases whose detection is dependent upon a number of factors, some of which are outside the parameters of the screening services being performed.

South Dakota Department of Health - Infectious Disease Surveillance				
Selected Morbidity Report, 1 January – 31 August 2004 (provisional numbers)				
	Disease	2004 year-to-date	5-year median	Percent change
Vaccine-Preventable Diseases	Diphtheria	0	0	na
	Tetanus	0	0	na
	Pertussis	18	4	+350%
	Poliomyelitis	0	0	na
	Measles	0	0	na
	Mumps	0	0	na
	Rubella	0	0	na
	<i>Haemophilus influenza</i> type b	0	0	na
Sexually Transmitted Infections and Blood-borne Diseases	HIV infection	14	16	-13%
	Hepatitis B	0	1	-100%
	Chlamydia	1625	1196	+36%
	Gonorrhea	175	166	+5%
	Genital Herpes	222	212	+5%
	Syphilis, primary & secondary	0	0	na
Tuberculosis	Tuberculosis	8	13	-38%
Invasive Bacterial Diseases	<i>Neisseria meningitidis</i>	2	5	-60%
	Invasive Group A <i>Streptococcus</i>	12	12	+0%
Enteric Diseases	<i>E. coli</i> O157:H7	27	34	-21%
	Campylobacteriosis	194	119	+63%
	Salmonellosis	75	73	+3%
	Shigellosis	9	11	-18%
	Giardiasis	42	60	-30%
	Cryptosporidiosis	23	12	+92%
	Hepatitis A	3	2	+50%
Vector-borne Diseases	Animal Rabies	74	73	+1%
	Tularemia	4	6	-33%
	Rocky Mountain Spotted Fever	4	2	+100%
	Malaria (imported)	1	0	na
	Hantavirus Pulmonary Syndrome	1	0	na
	Lyme disease	0	0	na
	West Nile Virus disease	25	0	na
Other Diseases	<i>Streptococcus pneumoniae</i> , drug-resistant	5	1	+400%
	Legionellosis	3	2	+50%
	Additionally, the following diseases were reported: Bacterial meningitis, non-meningococcal (14), Chicken pox (43); Invasive Group B <i>Streptococcus</i> (9); <i>Streptococcal</i> Toxic Shock Syndrome (1); MRSA, invasive (18)			

Communicable diseases are obligatorily reportable by physicians, hospitals, laboratories, and institutions.

The **Reportable Diseases List** is found at www.state.sd.us/doh/Disease/report.htm or upon request.

Diseases are reportable by telephone, mail, fax, website or courier.

Telephones: 24 hour answering device 1-800-592-1804; for a live person at any time call 1-800-592-1861; after hours emergency 605-280-4810. **Fax** 605-773-5509.

Mail in a sealed envelope addressed to the DOH, Office of Disease Prevention, 615 E. 4th Street, Pierre, SD 57501, marked "Confidential Medical Report". **Secure website:** www.state.sd.us/doh/diseasereport.htm.